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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/625,085	07/23/2003	Sabine Gratzner	DEAV2002/0051US NP	5941
5487	7590	06/27/2008		
ANDREA Q. RYAN SANOFI-AVENTIS U.S. LLC 1041 ROUTE 202-206 MAIL CODE: D303A BRIDGEWATER, NJ 08807			EXAMINER JOIKE, MICHELE K	
			ART UNIT 1636	PAPER NUMBER
			NOTIFICATION DATE 06/27/2008	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/625,085	<b>Applicant(s)</b> GRATZER ET AL.	
	<b>Examiner</b> MICHELE K. JOIKE	<b>Art Unit</b> 1636	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 March 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3,4,7-13 and 16-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 4, 7-13, and 16-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

Receipt is acknowledged of a reply to the previous Office Action, filed March 19, 2008. Claims 1, 3, 4, 7-13, and 16-20 are pending and under consideration in the instant application.

Any rejection of record in the previous Office Action, mailed September 21, 2007 that is not addressed in this action has been withdrawn.

Because this Office Action only maintains rejections set forth in the previous Office Action and/or sets forth new rejections that are necessitated by amendment, this Office Action is made FINAL.

#### **Response to Arguments Concerning Claim Rejections – 35 USC § 102(b)**

Applicants' arguments filed on March 19, 2008 have been fully considered. The following grounds of traversal are presented:

Brown et al do not teach adding the substrate with a delay.

Applicants also argue that claim 6 was not rejected and the limitations of that claim have now been incorporated into claim 1. Therefore the claims are patentable over the cited prior art.

Applicant's arguments have been found persuasive for the following reasons.

Brown et al do not teach adding the substrate with a delay.

Claim 6 was not rejected under 35 USC 102(b) as being anticipated by Brown et al. It was, however, rejected under 35 USC 103(a). The claim was not indicated as

Art Unit: 1636

being allowable. Claim 6 is now canceled, however claim 1 that includes the limitations of claim 6 is now rejected under 103(a).

The 35 USC §102(b) rejection applying the Brown et al reference is withdrawn. However, applicants' amendment has necessitated the new grounds of rejection under 35 U.S.C. 103(a) recited below.

**Response to Arguments Concerning Claim Rejections – 35 USC § 103(a)**

Applicants' arguments filed on March 19, 2008 have been fully considered. The following grounds of traversal are presented:

Crossin et al do not teach adding the substrate with a delay.

Applicant's arguments have been found persuasive for the following reasons.

Crossin et al do not teach adding the substrate with a delay. Applicants' amendment has necessitated the new grounds of rejection under 35 U.S.C. 103(a) recited below.

Keating et al teach adding the substrate after cell extracts were prepared, which teaches away from the invention.

Applicant's arguments have not been found persuasive for the following reasons.

Keating et al teach adding the substrate after cell extracts were prepared, which is adding the substrate after there is a delay. Therefore, there is no teaching away.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 3, 4, 7-13, 16, 17, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Keating et al in view of Brown et al and in view of US 20050118690 and in further view of Yang et al.

Applicant claims a method of identifying an agent that modulates the activity of a target molecule wherein the agent contacts a cell and modulates the target molecule, and wherein said cell also comprises two reporter genes. After contact by agent, cell propagation and reporter activity are measured. One of the reporter genes produces an enzyme, and the substrate of the enzyme is added after a delay, specifically at least two cell cycles. Measuring reporter activity comprises disrupting the cell by permeabilizing

Art Unit: 1636

the membrane, or destroying the membrane. The target molecule affects the reporter gene, and is further limited to a heterologous molecule and can be a nucleic acid or polypeptide. The target molecule affects cellular propagation indirectly or through an intermediary molecule. The target molecule can also affect the reporter gene and cellular propagation directly. The reporter gene produces an enzyme whose activity is detectable on the basis of conversion of a substrate. The cell is a yeast cell, specifically *S. cerevisiae*.

Keating et al (Oncogene 20: 4281-4290, 2001, specifically Introduction, p. 4282 and Materials & Methods, 1<sup>st</sup> and 6<sup>th</sup> paragraphs) teach a method of identifying an agent that modulates the activity of a target molecule by contacting a cell and modulating a target molecule, wherein an agent, EGF, modulates a target molecule, ATM (a heterologous kinase), which induces a luciferase reporter. ATM is known to be involved in cell cycle control (see Abstract & Introduction). Cells were incubated with EGF for 16 hours before cells extracts were prepared. EGF was added during log phase, therefore at least one or two cell cycles have occurred. Firefly luciferase substrate (LARII) was added and reporter activity was measured using a Dual Luciferase Assay. However, Keating et al do not teach the use of two different reporters or improving signal-to-background ratio.

Brown et al (Yeast 16: 11-22, 2000, specifically, pp. 12-14, 16, 19 and Table 3) teach a dual reporter assay for evaluating chimeric yeast/mammalian G $\alpha$  proteins in *S. cerevisiae*. G $\alpha$  proteins can modulate effectors to cause signal propagation. GPCRs can also directly affect propagation. Table 3 lists the different concentrations of

Art Unit: 1636

agonists used to determine the effect on the pheromone response pathway. The two reporter constructs used are FUS1-HIS3 and FUS1-lacZ. As stated in the specification on page 10, when these two constructs are combined, the improved signal-to-background ratio is 100-150:1. A beta-galactosidase assay is performed with CPRG as the substrate to measure activity. CPRG is converted to chlorophenol red after 24 hrs. of incubation. Cell growth is also determined. The cells were also disrupted to perform a Western blot. Glass beads are used to disrupt the membrane.

Yang et al (J. Biol. Chem. 273(14): 8212-8216, 1998, specifically p. 8212, 8214, 8216) teach a dual fluorescent assay for improving signal-to-background ratio. Specifically, they teach optimizing GFP and BFP to enhance expression levels.

The ordinary skilled artisan, desiring to use a dual reporter system to improve signal-to-background ratio, would have been motivated to combine the teachings of Keating et al teaching a method of identifying an agent that modulates the activity of a target molecule, which induces a reporter and delays adding the substrate of a reporter, with the teachings of Brown et al teaching a dual reporter system with HIS3 as the first reporter and lacZ as the second reporter, and with the teachings of Yang et al teaching a dual reporter system for improving signal-to-background ratio because Yang et al states that enhancing optimization of two reporters allows for maximum signal intensity. It would have been obvious to one of ordinary skill in the art to improve signal-to-background ratio because higher expression yields provide greater sensitivity. Given the teachings of the prior art and the level of the ordinary skilled artisan at the time of the applicant's invention, it must be considered, absent evidence to the contrary, that

said skilled artisan would have had a reasonable expectation of success in practicing the claimed invention.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crossin et al in view of Keating et al, in view of US 6,063,578 and in further view of US 20050118690.

Applicant claims a method of identifying an agent that modulates the activity of a target molecule, wherein the agent contacts a cell and modulates the target molecule, and wherein said cell also comprises two reporter genes. After contact by agent, cell propagation and reporter activity are measured. The reporter genes produce a growth marker reporter and a reporter that is an enzyme. Measuring reporter activity comprises disrupting the cell by permeabilizing the membrane, or destroying the membrane. They also claim a second cell with a target molecule and reporter gene. After contact by agent, cell propagation and reporter activity are measured. The substrate of the enzyme is added after a delay

Crossin et al (PNAS 94: 2687-2692, 1997, specifically Abstract, Introduction, last paragraph, Exptl. Procedures, 2<sup>nd</sup>, 7<sup>th</sup> and last paragraph and Figure 4) teach a method of identifying an agent that modulates the activity of a target molecule by contacting a cell and modulating a target molecule, wherein an agonist, N-CAM, modulates a target molecule, GRE, which induces a luciferase reporter. N-CAM inhibits cell proliferation. In measuring luciferase activity, cells were lysed. They also teach a second cell with a second target molecule, CM-V and a second reporter beta-galactosidase. N-CAM is the



Art Unit: 1636

agonist. However, Crossin et al do not teach the use of two reporters or adding the substrate after a delay.

Keating et al (Oncogene 20: 4281-4290, 2001, specifically Introduction, p. 4282 and Materials & Methods, 1<sup>st</sup> and 6<sup>th</sup> paragraphs) teach a method of identifying an agent that modulates the activity of a target molecule by contacting a cell and modulating a target molecule, wherein an agent, EGF, modulates a target molecule, ATM (a heterologous kinase), which induces a luciferase reporter. ATM is known to be involved in cell cycle control (see Abstract & Introduction). Cells were incubated with EGF for 16 hours before cells extracts were prepared. EGF was added during log phase, therefore at least one or two cell cycles have occurred. Firefly luciferase substrate (LARII) was added and reporter activity was measured using a Dual Luciferase Assay. However, Keating et al do not teach the use of two different reporters or improving signal-to-background ratio.

US 6,063,578 (specifically columns 8-10) teach a dual reporter assay. Two different reporters need to be used. Enzymatic and fluorescent proteins are taught. It also is stated that the precise reporter genes used are not critical as long as expression can be detected.

US 20050118690 (specifically paragraphs 92 and 93) teach a dual reporter assay for isolating transformants. US 20050118690 teach that it is preferable to have two reporter genes within the cell. One reporter gene, when expressed, provides a growth advantage to transformed cells that are expressing the variant regulator protein, like LEU2, HIS3, LYS2, TRP1, URA3 or ADE2. This allows for the isolation of such

Art Unit: 1636

transformants through selective pressures. The other reporter gene provides a colorimetric marker, such as the lacZ gene and its encoded protein, beta-galactosidase. Alternatively, the second reporter provides a fluorescent or luminescent marker, such as green fluorescent protein (GFP).

The ordinary skilled artisan, desiring to use a dual reporter system, would have been motivated to combine the teachings of Crossin et al teaching a method of identifying an agent that modulates the activity of a target molecule, which induces a reporter, with the teachings of US 20050118690 teaching a dual reporter system with LEU2, HIS3, LYS2, TRP1, URA3 or ADE2 as the first reporter and lacZ or GFP as the second reporter, and with the teachings of US 6,063,578, teaching a dual reporter system because US 6,063,578, states that the dual reporter system allows for observation of more than one change induced by a candidate agent. For example, one reporter can indicate whether there is a change in replication, while the second reporter can indicate whether there is a change in transcription. It would have been obvious to one of ordinary skill in the art to use dual reporters because both processes occur on the same molecule, which more accurately reflects the natural environment. Given the teachings of the prior art and the level of the ordinary skilled artisan at the time of the applicant's invention, it must be considered, absent evidence to the contrary, that said skilled artisan would have had a reasonable expectation of success in practicing the claimed invention.

***Allowable Subject Matter***

No claims are allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHELE K. JOIKE whose telephone number is (571)272-5915. The examiner can normally be reached on M-F, 9:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Woitach can be reached on 571-272-0739. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1636

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/NANCY VOGEL/  
Primary Examiner, Art Unit 1636

Michele K Joike, Ph.D.  
Examiner  
Art Unit 1636